MAIL STOP APPEAL

BRIEF - PATENTS

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Applicant:	A.F. Champernowne	Attorney Docket No. EXIN117029
Application No:	09/825,451	Group Art Unit: 3629
Filed:	April 2, 2001	Examiner: J.A. Mooneyham
Title:	OPTIMIZED SYSTEM AND METHOD FOR FINDING BEST FARES	

APPELLANT'S REPLY BRIEF

Seattle, Washington
September 29, 2005

TO THE COMMISSIONER FOR PATENTS:

This Reply Brief is filed in response to the Examiner's Answer of July 29, 2005, and pursuant to 37 C.F.R. § 1.193(b)(1).

LAW OFFICES OF
CHRISTENSEN O'CONNOR JOHNSON KINDNESS[PLLC]
1420 Fifth Avenue
Suite 2800
Seattle, Washington 98101
206.682.8100

Regarding the Summary of Invention

The Examiner's Answer stated that the Summary of Invention section of appellant's Appeal Brief was deficient, and accordingly, a large portion of the Summary (section A) should be ignored by the Board. (Examiner's Answer, page 2.) The Examiner's Answer also stated that, with regard specific references of the claim language to the specification, the language of the claims does not correspond to the cited references. (Examiner's Answer, page 3.)

With regard to the perceived deficiency of th Summary of Invention, the Examiner's Answer asserts that the Summary of Invention is to be "a concise explanation of the subject matter defined in each of the independent claim [sic] involved in the appeal." (Examiner's Answer, page 2.) However, this is not the standard set forth in 37 C.F.R. 1.192(c)(5), or as found in the M.P.E.P § 1206. As stated in the M.P.E.P. § 1206, the Summary of Invention is to be a "concise explanation of the invention defined in the claims involved in the appeal." Accordingly, appellant provided a Summary of Invention as defined in the claims in the Appeal Brief. The Summary of Invention further included background and explanatory information not found in independent claims in order to provide the requisite explanation and/or understanding of the invention defined by the claims.

In regard to the specific references made to the specification, appellant cited to a printed copy of the specification that differed in pagination from the specification that was filed with the USPTO.

Appellant was not notified that the Appeal Brief failed to comply with the requirements of 37 C.F.R. 1.192(c), as set forth in 37 C.F.R. 1.192(d). According to 37 C.F.R. 1.192(d), such notice would have included a period of one month to correct defects in the Appeal Brief. The M.P.E.P § 1206 states that it is entirely in the perview of the Examiner to determine whether an Appeal Brief meets the requirements of 37 C.F.R. 1.192(c). Unfortunately, as the Appeal Brief

LAW OFFICES OF
CHRISTENSEN O'CONNOR JOHNSON KINDNESS[PLLC]
1420 Fifth Avenue
Suite 2800
Seattle, Washington 98101
206.682.8100

was not rejected, appellant was denied the opportunity to correct any perceived defects in the Appeal Brief. As such, requesting that the Board now reject/ignore substantial portions of the Appeal Brief – specifically, a significant portion of the Summary of Invention - as being deficient falls well outside of the rules set forth in 37 C.F.R 1.192, and places appellant at a distinctly unfair disadvantage, i.e., lacking an opportunity to provide an explanation and/or summary of the invention to the Board.

Appellant put forth a good faith effort to provide a "concise explanation" of the invention in the Appeal Brief, and as appellant was not notified that it was deficient, submits that there is no legitimate basis for the Summary of Invention, or a part thereof, to be disregarded by the Board. However, as an alternative, appellant has provided a substitute Summary of Invention below. This substitute includes corrected references to the specification. Moreover, consistent with the suggestion in the Examiner's Answer that the Summary of Invention be directed to the independent claims only, only references for the independent claims are provided.

Substitute Summary of the Invention

The present invention is directed towards finding the best air fares available for a potential traveler/customer in a computationally non-prohibitive manner in response to a fare request from a customer. To find the best air fares available in a computationally non-prohibitive manner, a solution tree is generated/utilized.

In a solution tree each upper level in the solution tree includes partial fare solutions from the preceding level plus at least one additional element of information required to generate complete fare solutions. At the top-most level of the solution tree are complete fare solutions.

As those skilled in the art will appreciate, however, if each partial fare solution of each lower level were fully expanded with all permutations of available options, the nodes (partial fare

LAW OFFICES OF
CHRISTENSEN O'CONNOR JOHNSON KINDNESS[PLLC]
1420 Fifth Avenue
Suite 2800
Seattle, Washington 98101
206.682.8100

solutions) in the solution tree would grow exponentially, and processing them to completion would be computationally prohibitive.

In order to keep the solution tree from expanding in an exponential growth pattern, as trip information is added to the partial fare solutions on a lower level (to create partial fare solutions on a higher level), non-optimal partial fare solutions are eliminated from further processing. In other words, only optimal partial fare solutions on any given level are expanded upon with additional information in an upper level. "Optimal" may be based on various criteria, including price, whether a flight is a direct flight, departure time, etc.

When all trip information is added to the partial fare solutions, the remaining fare solutions, now complete fare solutions, are optimal fare solutions. As only optimal fare solutions are generated, substantial numbers of partial fare solutions were not processed. Thus, computation savings are realized. Moreover, as substantially less processing is required for each fare request, a solution tree may be built for each fare request.

Independent Claim 1

Independent Claim 1 is directed at a method for finding at least one best fare for a trip. The method comprises, at a query server in response to a fare query from a client computer, determining a set of partial fare solutions for the trip. (Specification, pg. 15, lines 25-30; and original Claim 1.) Trip information is added to the set of partial fare solutions in order to define a set of complete fare solutions. (Specification, pg. 18, lines 10-23.) As trip information is added to the partial fare solutions, partial fare solutions that are non-optimal partial solutions are eliminated. (Specification, pg. 20, line 19 - 22; and pg. 21, lines 31-34.) Thereafter, a subset of said complete fare solutions as the best fares for the trip is returned. (Specification, pg. 20, lines 1-8.)

LAW OFFICES OF
CHRISTENSEN O'CONNOR JOHNSON KINDNESS[PLLC]
1420 Fifth Avenue
Suite 2800
Seattle, Washington 98101
206.682.8100

Independent Claim 13

Independent Claim 13 is directed at a computer-readable medium containing computer-executable instructions. When executed on a computing device, the instructions carry out a method for finding at least one best fare for a trip. The method comprises determining a set of partial fare solutions for the trip. (Specification, pg. 15, lines 25-30; and original Claim 1.) Trip information is added to the set of partial fare solutions in order to define a set of complete fare solutions. (Specification, pg. 18, lines 10-23.) As trip information is added to the partial fare solutions, partial fare solutions that are non-optimal partial solutions are eliminated. (Specification, pg. 20, line 19 - 22; and pg. 21, lines 31-34.) Thereafter, a subset of said complete fare solutions as the best fares for the trip is returned. (Specification, pg. 20, lines 1-8.)

Independent Claim 25

Independent Claim 25 is directed at a query server apparatus in a communication network finding at least one best fare for a trip. The query server apparatus comprises a processor and a memory coupled to the processor. The memory stores program code, which when executed in response to a fare query, causes the apparatus to perform the following: determining a set of partial fare solutions for the trip. (Specification, pg. 15, lines 25-30; and original Claim 1.) Trip information is added to the set of partial fare solutions in order to define a set of complete fare solutions. (Specification, pg. 18, lines 10-23.) As trip information is added to the partial fare solutions, partial fare solutions that are non-optimal partial solutions are eliminated. (Specification, pg. 20, line 19 - 22; and pg. 21, lines 31-34.) Thereafter, a subset of said complete fare solutions as the best fares for the trip is returned. (Specification, pg. 20, lines 1-8.)

Basis for Which the Rejections Should Be Overturned

As described in appellant's appeal brief, filed May 6, 2005, appellant asserts, and requests that the Board finds, that:

LAW OFFICES OF
CHRISTENSEN O'CONNOR JOHNSON KINDNESS^PLLC
1420 Fifth Avenue
Suite 2800
Seattle, Washington 98101
206.682.8100

(1) U.S. Patent No. 6,295,521 to DeMarcken *et al.* (hereinafter "DeMarcken") fails to disclose each and every element of Claims 1, 3, 9, 10, 13, 15, 21, 22, 25, 27, 33, and 24;

(2) DeMarcken fails to teach or suggest each element of Claims 2, 14, and 26; and

(3) The combination of DeMarcken and International Publication No. WO 01/29693 to Sabre Inc. (hereinafter "Sabre") fail to teach or suggest each element of claims 4-8, 11, 12, 16-20, 23, 24, 28-32, 35, and 36.

While these issues are described in detail in the Appeal Brief, appellant would like to take the opportunity to respond to the first two, and in particular to issues on which appellant disagrees with the Examiner's Answer.

Whether DeMarcken Discloses Each Element of Claim 1

To help the Board better understand why appellant believes that the rejections of the claims are improper, the following description and images are presented. The first figure, Figure 1 (following page), illustrates the response to a query according to the present invention. As can be seen in Figure 1, when a request is received, a first set of information is added to a root node, forming a first level of partial fare solutions. (Letters are used to indicate that at each level of the solution tree, an additional piece of information is added.) Of those partial fare solutions, those that are not optimal are eliminated from additional processing, as indicted by the "X" on certain partial fare solutions. Additional information is added to the optimal partial fare solutions on level one to create level two partial fare solutions. Again, those partial fare solutions that are not optimal are eliminated from additional processing. Repeating the process of adding additional information while eliminating those partial fare solutions that are non-optimal ultimately yields a set of complete fare solutions. These complete fare solutions are known to be optimal due to the prior processing, and no solution that was not optimal was

LAW OFFICES OF
CHRISTENSEN O'CONNOR JOHNSON KINDNESS PLLC
1420 Fifth Avenue
Suite 2800
Seattle, Washington 98101
206.682.8100

completed. As only a subset of all of the complete fare solutions is generated, their generation is completed in a computationally non-prohibitive manner.

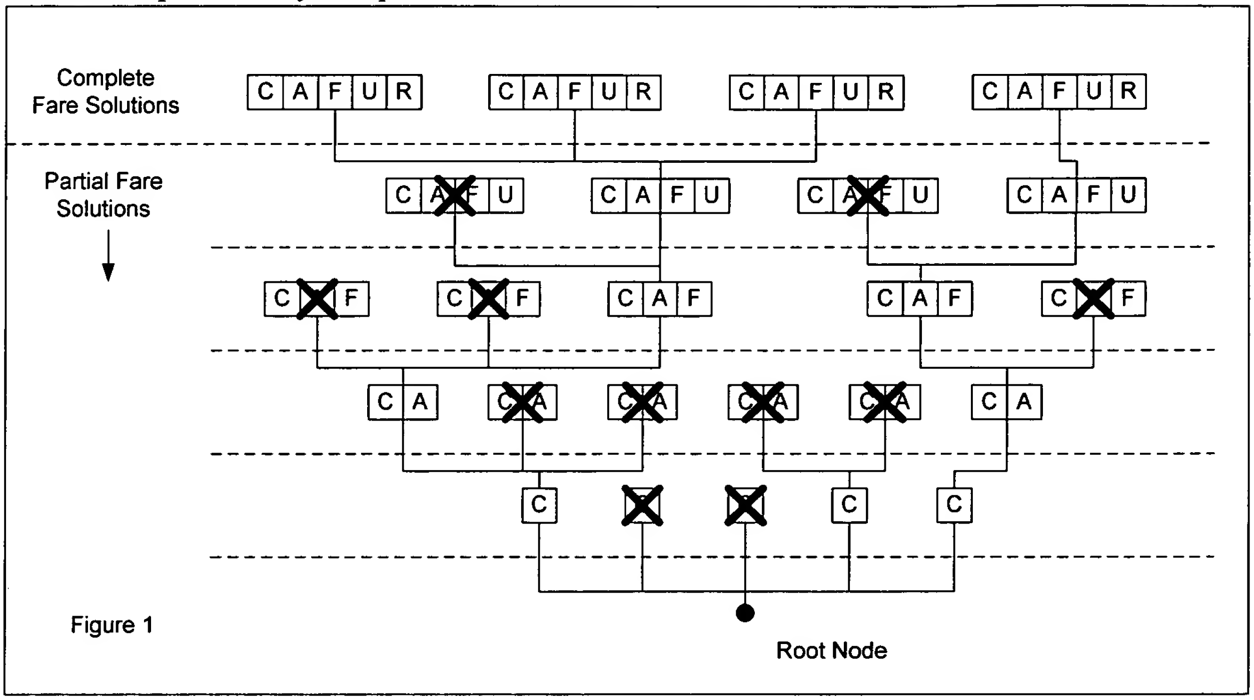

Figure 1

In contrast to the present invention, in response to a fare request, and with regard to Figure 2 (following page), DeMarcken obtains a set of pricing solutions from a server process. (DeMarcken, col. 4, lines 25-31.) This set of pricing solutions is described as "the largest number of possible itineraries" from various computer reservation systems. (DeMarcken, col. 4, lines 52-53.) DeMarcken describes the size of this set as "tens of millions to hundreds of billions." (DeMarcken, col. 49, lines 19-23.) This complete set of all pricing solutions is represented in Figure 2.

DeMarcken first obtains the entire set of pricing solutions. Once this large set of solutions is obtained, a faring process prunes out those pricing solutions, which are complete pricing solutions, that are not actually valid solutions. (DeMarcken, col. 5, lines 1-6.) Because managing ten million pricing solutions in a "normal" list file would be impractical, DeMarcken

LAW OFFICES OF
CHRISTENSEN O'CONNOR JOHNSON KINDNESS^PLLC
1420 Fifth Avenue
Suite 2800
Seattle, Washington 98101
206.682.8100

then compacts the solutions into a structure called the directed acyclical graph, or DAG. (DeMarcken, col. 5, lines 37-42.) Appellant notes that DeMarcken frequently refers to the DAG as the "compact representation 38' " or "pricing solution 38' ". (DeMarcken, col. 5, lines 36-37.) The DAG is distributed to users. However, the DAG still includes a compleete set of all pricing solutions whether optimal or not. To extract various information from the DAG, the user employs an enumeration/extraction process. Various defined enumerations/extractions are set forth as "value functions." (DeMarcken, col. 50, line 40-col. 51, line 55; Figure 19.)

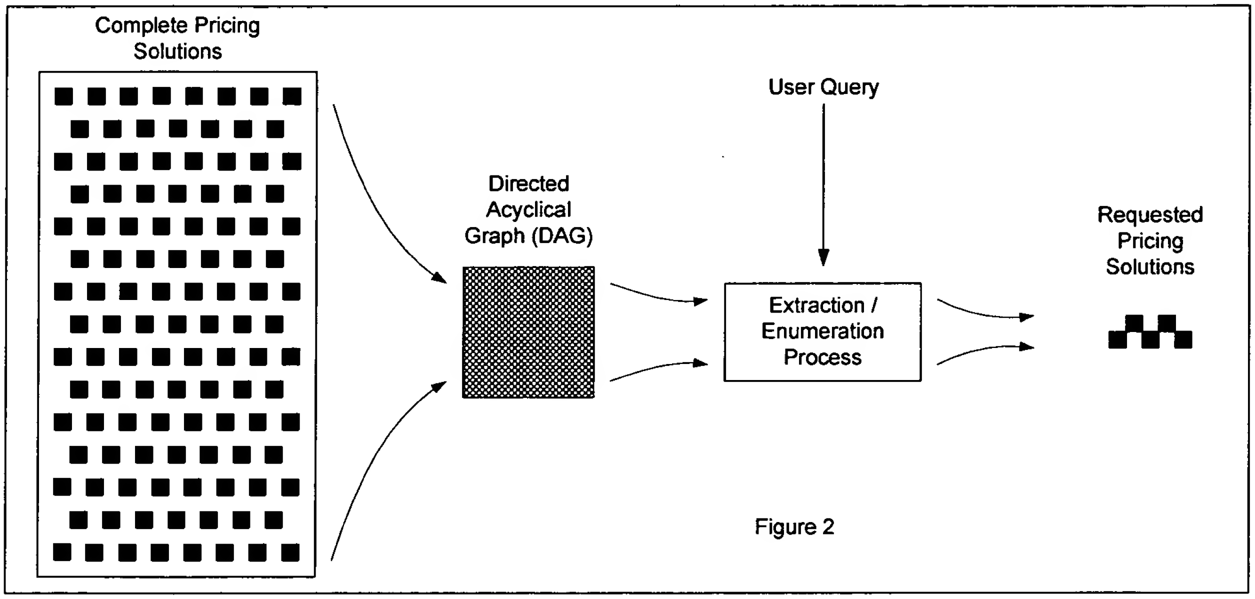

Figure 2

As is clear from the above description and Figure 2, the disclosure of DeMarcken is substantially distinct from the claims of the present invention. More particularly, DeMarcken first gathers ***all*** itineraries whether optimal or not, compresses them, and then responds to a user's query. Moreover, the response to the user's query is an enumeration or extraction process. It is not the equivalent of "as trip information is **added** to the partial fare solutions, eliminating partial fare solutions that are non-optimal partial solutions."

LAW OFFICES OF
CHRISTENSEN O'CONNOR JOHNSON KINDNESS[PLLC]
1420 Fifth Avenue
Suite 2800
Seattle, Washington 98101
206.682.8100

The Examiner's Answer has cited to the following passages as disclosing "eliminating partial fare solutions that are non-optimal" while adding trip information to the partial fare solutions: Col. 5, lines 4-6; Col. 49, line 30 - Col. 50 line 39; Figure 19; Col. 2, lines 27-37; Col 53, line 25 - Col. 54, line 34; and Col. 55, lines 48-62.

Column 5, lines 4-6 is directed at the faring process described above which validates the fares of the pricing solution (apparently prior to its compression into the DAG.) While this passage may disclose deleting invalid solutions, there is no disclosure of **adding information to partial fare solutions**. This is certainly not the equivalent of the element cited above.

Column 49, line 30 - Col. 50, line 39 is a section entitled "Manipulating the Pricing-Graph", which is a reference to the DAG. Clearly, as this section is disclosing the manipulation of the DAG, the pricing solutions have already been built, so once again there is no "adding trip information" aspect. Moreover, this section is directed at "**extract[ing]** from the pricing graph 38' certain pricing solutions 308 that satisfy parameters specified by the user query 302." (DeMarcken, Col 49, lines 35-37.) In other words, this passage discloses extracting information from the already completed DAG, not eliminating non-optimal pricing solutions, as trip information is added to the partial fare solutions.

Figure 19 illustrates various value functions that may be selected by a user, such as extracting the lowest priced item from the DAG, etc. Nothing in Figure 19 discloses "as trip information is added to the partial fare solutions, eliminating partial fare solutions that are non-optimal partial solutions."

Column 2, lines 27-37 describe manipulating the DAG. This passage suggests a "pruning process responsive to user preferences that alters the directed acyclical graph representation in such a manner so as to eliminate undesirable pricing solutions." (DeMarcken, Col. 2, lines 30-34.) However, as discussed above, the DAG is a large set of completed solutions. As such,

LAW OFFICES OF
CHRISTENSEN O'CONNOR JOHNSON KINDNESS^PLLC
1420 Fifth Avenue
Suite 2800
Seattle, Washington 98101
206.682.8100

even though there is a pruning of solutions from the DAG, this is not the equivalent of "as trip information is added to the partial fare solutions, eliminating partial fare solutions that are non-optimal partial solutions."

Column 53, line 25 - Column 54, line 34 describes invalidating nodes within the DAG. Again, this means that the set of nodes is already completed, and the user is now trying to eliminate undesirable ones. There is no disclosure of adding information to partial fare solutions, and while doing so, eliminating non-optimal partial fare solutions.

Finally, Column 55, lines 48-62 describe enumerating the pricing solutions. In describing the enumeration, DeMarcken dequeues certain partial solutions and expands them. (DeMarcken, Col. 55, lines 56-57.) However, a clear understanding of the pricing graph/DAG as described in DeMarcken informs the reader that this simply means examining a pricing solution in the DAG. It does not disclose adding trip information to partial fare solutions. In DeMarcken, that would be nonsensical. Complete fare solutions have already been retrieved and stored in the DAG. Enumeration is simply an extraction process. As such, the only way to understand "expanding a pricing solution" is to understand that the information is completely retrieved from its storage in the DAG. Of course, this is patentably distinct from "as trip information is added to the partial fare solutions, eliminating partial fare solutions that are non-optimal partial solutions."

In sum, appellant submits that DeMarcken fails to disclose each element of independent Claim 1, and in particular, fails to disclose "as trip information is added to the partial fare solutions, eliminating partial fare solutions that are non-optimal partial solutions." Independent Claims 13 and 25 also include this same element. Appellant therefore asserts that the 35 U.S.C. § 102 rejections of Claims 1, 13, and 25 are in error, and should be withdrawn.

LAW OFFICES OF
CHRISTENSEN O'CONNOR JOHNSON KINDNESS[PLLC]
1420 Fifth Avenue
Suite 2800
Seattle, Washington 98101
206.682.8100

Whether Claims 2, 14, and 26 are obvious in view of DeMarcken

The Examiner's Answer acknowledges that DeMarcken fails to "disclose assigning the fare components to a plurality of first nodes, at least one carrier to a plurality of second nodes, at least one flight corresponding to a plurality of third nodes, assigning at least one priceable unit to a plurality of fourth nodes, and assigning at least one fare corresponding to a plurality of leaf nodes." (Examiner's Answer, pg. 7.) However, the examiner suggests (1) that DeMarcken discloses a data structure that could be logically manipulated to extract a plurality of pricing solutions, and (2) it would have been obvious to one of ordinary skill in the art to do so.

In the first place, the ability to manipulate a pricing graph cannot be reasonably construed as a specific order of adding trip information to partial fare solutions. Secondly, even if manipulating a pricing graph of complete pricing solutions were somehow the equivalent of adding trip information to partial pricing solutions, that something is technically possible does not make it otherwise obvious. In other words, there is no teaching or suggestion in DeMarcken to add information to partial fare solutions in the specified manner. Appellant submits that the teaching or suggestion to make the claimed combination must be found in the prior art, not appellant's disclosure. See, *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991).

Appellant submits that a proper prima facie case of obviousness was not made with regard to Claims 2, 14, and 26. Accordingly, appellant requests that the 35 U.S.C. § 103(a) rejection of these claims be overturned.

LAW OFFICES OF
CHRISTENSEN O'CONNOR JOHNSON KINDNESS[PLLC]
1420 Fifth Avenue
Suite 2800
Seattle, Washington 98101
206.682.8100

Conclusion

All other claims currently on appeal depend from independent Claims 1, 13, and 25. Appellant submits that as the independent claims are in condition for allowance, all dependent claims are also in condition of allowance, and requests that the honorable members of the Board withdraw the current rejections and allow the claims.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is invited to contact Tracy S. Powell, Reg. No. 53,479, at the telephone number of the undersigned below.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future Replies, to charge payment or credit any overpayment to Deposit Account No. 03-1740 regarding fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.16.

Respectfully submitted,

CHRISTENSEN O'CONNOR
JOHNSON KINDNESS PLLC

Tracy S. Powell

Tracy S. Powell
Registration No. 53,479
Direct Dial No. 206.695.1786

I hereby certify that this correspondence is being deposited in triplicate with the U.S. Postal Service in a sealed envelope as first class mail with postage thereon fully prepaid and addressed to Mail Stop Appeal Brief - Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the below date.

Date: 9/29/05 Tracy S. Powell

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LAW OFFICES OF
CHRISTENSEN O'CONNOR JOHNSON KINDNESS PLLC
1420 Fifth Avenue
Suite 2800
Seattle, Washington 98101
206.682.8100